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TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: 12758-016001

U.S. APPLICATION NO. (If Known, see 37 CFR 1.5): 09/763483

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP99/06284	26 August 1999	28 August 1998

TITLE OF INVENTION: TELECOMMUNICATIONS SYSTEM AND METHOD FOR PRODUCING A MASTER CLOCK IN THE SAME

APPLICANT(S) FOR DO/EO/US: Stefan Hennen, Annette Roder, Klemens Skorka, Klaus Steinigke and Eckhardt Belgardt

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to promptly begin national examination procedures (35 U.S.C. 371(f)).
4. ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is attached hereto (required only if not communicated by the International Bureau).
   b. ☐ has been communicated by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☒ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ An English language translation of amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 16 below concern other documents or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☐ Other items or information:

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I hereby certify under 37 CFR §1 10 that this correspondence is being deposited with the United States Postal Service as Express Mail Post Office to Addressee with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, Washington, D C 20231

Date of Deposit	Signature	Typed Name of Person Signing
2/21/01	Daniel C Messier	Daniel C Messier

U.S. APPLICATION NO. (IF KNOWN) 09/763483	INTERNATIONAL APPLICATION NO. PCT/EP99/06284	ATTORNEY'S DOCKET NUMBER 12758-016001

17. ☒ The following fees are submitted:

Basic National Fee (37 CFR 1.492(a)(1)- (5)):

	CALCULATIONS PTO USE ONLY	
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$1000**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$860**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$710**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) **$690**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) **$100**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$860.00	
Surcharge of **$130** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$0.00	

Claims	Number Filed	Number Extra	Rate		
Total Claims	30 - 20 =	10	x **$18**	$180.00	
Independent Claims	2 - 3 =	0	x **$80**	$0.00	
MULTIPLE DEPENDENT CLAIMS(S) (if applicable)			+ **$270**	$0.00	
			TOTAL OF ABOVE CALCULATIONS =	$1,040.00	
☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				$0.00	
			SUBTOTAL =	$1,040.00	
Processing fee of **$130** for furnishing the English Translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f))				$0.00	
			TOTAL NATIONAL FEE =	$1,040.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +				$0.00	
			TOTAL FEES ENCLOSED =	$1,040.00	
				Amount to be refunded:	$
				Charged:	$

a. ☒ A check in the amount of $1,040.00 to cover the above fees is enclosed.
b. ☐ Please charge my Deposit Account No. 06-1050 in the amount of $0.00 to cover the above fees. A duplicate copy of this sheet is enclosed.
c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-1050. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b) must be filed and granted to restore the application to pending status.

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Description

Telecommunications system and method for generating a master clock in the same

The invention concerns a telecommunications system according to the precharacterizing clause of Patent Claim 1 and a method for generating a master clock in such a telecommunications system. In particular the invention concerns digital telecommunications systems with at least two reference clocks which are redundant to each other and devices and methods for handling the loss of one of the reference clocks.

Telecommunications is a collective designation for all communications technology transmission methods through varied services in communications across relatively large distances between man-man, man-machine, and machine-machine. Through the growing together of information technology and communications technology, telecommunications is receiving a completely different significance. Telecommunications is characterized by transmission technology with cable technology, radiotelephony, data telephony, satellite technology, optical waveguide technology, modems, digital switching systems and switching technique, and local networks.

In order to facilitate meaningful information exchange between two (or more) partners, in addition to the pure transmission of information, a set of rules is necessary which determines the conventions which must be complied with for meaningful communication in the form of protocols. Rules of this kind are described, by way of example, in the service specifications of the individual levels of the OSI (open systems interconnection) reference model. The OSI reference model was prepared in the year 1983 by the International Standards Organization (ISO) starting with the transmission of information in the area of data processing and has since also become widely applied in the applications of communications systems.

The OSI model represents only principles of telecommunications transmission and accordingly only defines the logic of the information flow between participants. Since the OSI standard does not contain any specifications concerning the physical transmission of communications, it is manufacturer-independent, but for realization of a communications system, supplemental protocols are required for detailed specification based on other, by way of example, proprietary standards.

A fundamental distinction can be made between asynchronous and synchronous communication. Asynchronous communication generally means the exchange of information, completely decoupled with respect to time, between a sending entity and a receiving entity. It cannot be predicted when a send and an associated receive operation will be initiated.

In contrast, synchronous communication means the exchange of messages between a sending entity and a receiving entity in the event this exchange takes place in a fixed time frame. A send operation and the associated receive operation must always be performed at the same time.

Telecommunications networks are characterized by the possibility of bi- and multidirectional data exchange between the participants. This presupposes that each involved participant can communicate with each other participant over the same medium. The simplest realization of this is communication by all participants in the baseband. As a result of the plurality of parallel active participants, primarily methods are used in this case which statically assign the available bandwidth to the participants in the time division multiplex. As a result of the increasing use of optical waveguide technology, the necessity of improved intercontinental data communications, and increased capacity requirements, the plesiochronous digital hierarchy (PDH) which has predominated since the 1960s is increasingly being replaced by the synchronous digital hierarchy (SDH). The SDH international standard issued by the International Telecommunications Union

(ITU) resulted from the American standard SONET (Synchronous Optical Network), which was developed by the firm Bellcore in the United States and had its origins in the standard adapted by the Industrial Carriers Compatibility Forum (ICCF) in 1984.

Traditional telecommunications structures are based on time division multiplexing (TDM). In contrast, ATM (asynchronous transfer mode) transmits data only when it is necessary, i.e., frames are transmitted asynchronously. The first recommendations for ATM were published in the years 1990/1991, and both the ITU and the ATM Forum, which was founded in September 1991, worked with the standardization of ATM.

As is the case with other transmission methods, ATM fundamentally is based on packet transmission technology. Similarly to the OSI reference model, ATM is also subdivided vertically into several layers. In addition, there is a horizontal classification according to aspects of the data exchange between users, aspects of communications control, and management aspects. An illustration of the individual ATM layers onto the layers of the OSI reference model is not readily possible since the functions of some of the ATM layers are distributed over different OSI layers. In OSI terminology, ATM would be posited on the bit transmission level, but in addition it also provides several functions of the safeguarding level.

For transmission, ATM uses exclusively packets with a fixed length of 53 bytes. This rigid transmission unit is designated an ATM line and consists of a five-byte-long header and 48 bytes of useful information (payload). Depending on the assignment of bits 5-8 of the first header byte, UNI cells are distinguished from NNI cells.

In order to facilitate incremental introduction of the ATM transmission method both in long-distance networks as well as in local networks, ATM is not tied to a particular transmission

medium. The physical layer therefore is broken down into a media-dependent sublayer (PM) and a transmission-medium-independent sublayer (TC). The transmission of a cell takes place in a continuous cell stream. There is no fixed assignment between virtual ATM channels and time slots of the medium. On the contrary, several time slots are assigned in sequence for each virtual channel depending on the bandwidth required. The asynchronity in ATM therefore consists not of asynchronous access of the transfer medium with respect to time, but rather of the dynamic assignment of the bandwidth which can be used as a virtual channel based on the number of time slots required.

The direct transmission of ATM cells is the most efficient method since due to the adaptation to the transmission frame of medium there is no additional overhead. Instead, the cell stream is transmitted directly bit by bit. The essential drawback of direct cell transmission consists of the incompatibility with the transmission methods of the past in world communications networks since the infrastructure of these networks is based primarily on PDH and SDH systems.

Transmission through SDH is based on the interleaving of several ATM cells in the synchronous transport modules of the SDH hierarchy. Transmission of ATM cells over SDH in the past has been specified for SDH transmission rates of 155 Mbps and 622 Mbps (STM-1 and STM-4). In addition, the use of the STM-16 hierarchy level with 2.5 Gbps is provided.

Like ATM transmission over SDH, the use of existing PDH networks is provided for by the ITU. An ATM transmission over PDH hierarchy levels between 1.5 Mbps and 139 Mbps was standardized.

Telecommunications systems which have connections to standardized transmission networks such as PDH, SDH, or SONET as a rule require synchronization in order to achieve the necessary

quality at the interface to the transmission network. Two operating modes of synchronization are distinguished. In the case of an external synchronization, a clock is brought directly to the system by an external synchronization source. In contrast, in synchronization through the transmission route, the clock is obtained from the received data stream of the interface and is applied to the system as synchronization source. For this purpose, the received data frames in addition to the payload contain among other things supplemental information which describes the quality of the clock signal of an opposite terminal.

For a portion of the interface types in plesiochronous digital hierarchy, clock quality is transferred in the timing marker bit. In the case of SONET and of synchronous digital hierarchy, the quality of the clock signal is communicated in the so-called SSM byte (synchronization status message).

Since clock quality of a clock source to which the telecommunications system is synchronized can be changeable and a reference clock can also be lost, at least two reference clocks which are redundant to each other are used for the synchronization of telecommunications systems. The loss of a reference clock must be recognized by the telecommunications system, and it must then automatically switch over to the redundant reference clock.

Figure 2 shows a conventional telecommunications system which has a main processor MP 1, a master clock generator 2, and two peripheral processor platforms 3, 4. The processor platforms according to Figure 2 have an ATM multiplexer AMX 3 and an interface card 4 and are connected to the master clock generator 2. Interface cards 4 are connected to transmission networks and receive from them, in the data stream, at least one clock signal each which they pass on to master clock generator 2 through AMX 3. Master clock generator 2 contains a clock selector 5 which selects one of the received clock signals and generates a master clock synchronous to it.

Main processor 1 has a central databank in which, in addition to information on the condition of individual components, alarms on units which have failed and the number of reference clocks, also data concerning each individual reference clock is filed. This clock-specific data encompasses the interface card from which the reference clock is taken, the priority, the current quality, and the availability of reference clock and alarm signals on lost reference clocks.

Along with the central database which is maintained by master processor 1, the telecommunications system also has decentral (local) databases to which, by way of example, master clock generator 2 has access. These decentral databases are images of the central database, but they contain only such data as is needed for the particular unit. If data in the central database is changed, the telecommunications system also updates the decentral databases.

Such a change of the central database takes place, by way of example, if a peripheral processor platform or another unit fails, if the quality of a reference clock changes, or if a new reference clock is set up.

If a processor platform, for example an interface card 4, recognizes the loss of a reference clock, it reports this to main processor 1. The main processor relays a corresponding message to main clock generator 2, whereupon the main clock generator switches over to the redundant reference clock. The main processor also takes over the updating of the central database, the distribution of the data to the local databases, and the sending of the alarm for the loss.

Telecommunications systems of the aforementioned type which in generating a main clock have the described failure treatment, have the drawback that clock selector 5 of main clock generator 2 does not switch over to the redundant reference clock until after the time at which main processor

corresponding message to main clock generator 2, whereupon the main clock generator switches over to the redundant reference clock. The main processor also takes over the updating of the central database, the distribution of the data to the local databases, and the sending of the alarm for the loss.

Telecommunications systems of the aforementioned type which in generating a main clock have the described failure treatment, have the drawback that clock selector 5 of main clock generator 2 does not switch over to the redundant reference clock until after the time at which main processor 1 is needed for receiving and relaying fault messages. During this period of time, the telecommunications system is without a suitable reference clock, so that the clock frequencies can shift and data errors can occur on the transmission route.

Known from EP 0 849 904 A 2 is a synchronous digital telecommunications transmission system which contains network elements, a central clock generator, and a control device. The system facilitates the transmission of a quality indicator corresponding to the precision of the reference clock used in a network node. The selection of a reference clock takes place in the central clock generator which sends a message to the control device concerning its synchronization condition. The message contains the precision of the reference clock and the origin of the clock. The control device in turn sends instructions to all network elements as to which quality indicator they must relay to what output. Two of the network elements forward a clock signal to the central clock generator which contains a clock and in addition a quality indicator. The central clock generator selects one of these clock signals on the basis of the quality indicators. In the event of a fault, the synchronizer of the central clock generator continues to run in unsynchronized operation. The transmission of the message to the control device concerning the syn-

chronization condition of the central clock generator is described as being not time critical, since a change in the precision of the reference clock does not take effect on the synchronous digital telecommunications transmission system until a relatively long period of time of several hours or days.

The invention is based on the task of suggesting a telecommunications system and a method for generating a main clock in a telecommunications system with a lower degree of susceptibility to fault.

This task is solved through the objects of patent claims 1 and 15.

Advantageous embodiments of the invention are the objects of the dependent patent claims.

With the invention it is in particular achieved that the fault recognition and fault neutralization take place decentrally. As a result, the main clock generator recognizes a loss or a decline in quality directly from the peripheral processor platform and thus can quickly switch over to a redundant reference clock. As a result, the susceptibility of the telecommunications system to losses is reduced.

Figure 1 shows a preferred exemplary embodiment of a telecommunications system according to the invention and

Figure 2 shows a conventional telecommunications system.

In Figure 1, a preferred exemplary embodiment of a telecommunications system is shown which, as described above, comprises a main processor 1, a main clock generator 2 with a clock selector 5 as well as peripheral platforms 3, 4. The peripheral platforms advantageously in turn have an ATM multiplexer AMX 3 and an interface card 4. Beyond the conventional telecommunications system described in Figure 2, interface cards 4 have quality detectors 6 which determine the quality of the clock signal received from interface card 4 and interrupt the clock signal upon a decrease in the particular detected quality. By way of example, the quality detection by quality detector 6 can take place through reading and evaluating the timing marker bits in the case of a PDH interface card or of the SSM bytes in the case of SDH or SONET interface cards. According to another embodiment, the quality detector detects only the loss of the clock signal.

If quality detector 6 recognizes a drop in quality, preferably below a threshold value, or loss, it prevents the forwarding of the clock signal to main clock generator 2 over ATM multiplexer 3. Main clock generator 2 in contrast to the conventional telecommunications system depicted in Figure 2 furthermore has an interrupt detector 7 which recognizes the loss of one of the clock signals provided by ATM multiplexer 3 and interface card 4. In the case of such an interruption, interrupt detector 7 instructs clock selector 5 of main clock generator 2 over interrupt control line 8 to switch over to a redundant reference clock.

Preferably this interrupt is hardware controlled. In another preferred exemplary embodiment, the switchover to the redundant reference clock, however, is software controlled. Preferably data located in the local database is queried for this purpose.

Following the switchover to a redundant reference clock, main processor 1 is informed by the peripheral processor platforms by means of error messages concerning the decline in clock quality and the switchover to a redundant reference clock, whereupon main processor 1 updates the central database. Following this, the main processor distributes the updated data to the local databases. Finally, the sending out of the alarm of the fault can take place on the central main processor.

According to a variant of the preferred exemplary embodiment, the telecommunications system contains at least three peripheral processor platforms 3, 4. Upon a reduction of quality or a loss of the selected clock signal, clock selector 5 is instructed by interrupt detector 7 to switch over to one of the remaining redundant reference clocks. Main clock generator 2 then with the aid of the local database selects the reference clock whose quality is highest.

Preferably quality detector 6 of interface card 4 determines the quality of the received clock signal and interrupts the relaying of this clock signal on a software controlled basis. The interruption, however, can also take place on the basis of hardware control.

According to a further development of the preferred embodiment, quality detector 6 is a part of ATM multiplexer 3. Quality detector 6, however, can also be a self-contained unit along side ATM multiplexer 3 and interface card 4.

Patent Claims

1. Telecommunications system containing:
at least two devices (3, 4), for providing one clock signal each synchronous to a clock source, ith devices (3, 4) for providing each being connected to at least one of the clock sources and at least one of the provision devices (3, 4) encompassing an interface card to a standardized transmission network, and
a main clock generator (2) for generating a main clock of the telecommunications system, with the main clock generator (2) being connected with the provision devices (3, 4) and receiving from them the clock signals, with main clock generator (2) having means (5) for selecting one of the clock signals,
characterized in that
provision devices (3, 4) have means (6) for determining the quality of the at least one clock source and interrupt the provision of the respective clock signal upon a decline in the respective detected quality,
the main clock generator (2) has means (7) to recognize an interruption of the selected clock signal, and
the means (5) for the selection are connected to the means (7) for recognition and select a different clock signal if the selected clock signal is interrupted.

2. Telecommunications system according to Claim 1 characterized in that the telecommunications system contains at least three devices (3, 4) for provision and

the means (5) for selecting among the other clock signals the clock signal with the highest quality if the selected clock signal is interrupted.

3. Telecommunications system according to Claim 1 or 2
characterized in that the telecommunications system is a digital telecommunications system.

4. Telecommunications system according to one of Claims 1 through 3
characterized in that the telecommunications system has ATM architecture.

5. Telecommunications system according to Claim 4
characterized in that at least one of provision devices (3, 4) is an ATM multiplexer.

6. Telecommunications system according to one of Claims 1 through 5
characterized in that used as clock sources are transmission routes to which the telecommunications system is connected.

7. Telecommunications system according to Claim 6
characterized in that the telecommunications system is connected to a PDH transmission route and the means (6) for determining the quality evaluate the timing marker bit.

8. Telecommunications system according to Claim 6
characterized

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in that the telecommunications system is connected to an SDH transmission route and the means (6) for determining the quality evaluate the SSM byte.

9. Telecommunications system according to Claim 6
characterized in that the telecommunications system is connected to a SONET transmission route and the means (6) for determining the quality evaluate the SSM byte.

10. Telecommunications system according to one of Claims 1 through 9
characterized in that the provision devices (3, 4) also interrupt the provision in the event of the loss of the particular clock source.

11. Telecommunications system according to one of Claims 1 through 10
characterized in that the provision devices (3, 4) interrupt the provision on a hardware-controlled basis.

12. Telecommunications system according to one of Claims 1 through 10
characterized in that the provision devices (3, 4) interrupt the provision on a software-controlled basis.

13. Telecommunications system according to one of Claims 1 through 12
characterized

in that the means (5) for selecting the other clock signal select the other clock signal on a hardware-controlled basis.

14. Telecommunications system according to one of Claims 1 through 12
characterized in that the means (5) for selecting the other clock signal select the other clock signal on a software-controlled basis.

15. Method for generating a main clock in a telecommunications system, with the method having the following steps:
provision of at least two clock signals,
selection of one of the clock signals provided, and use of the selected clock signals as synchronization source of the main clock,
characterized through the following steps:
determination of the quality of the clock signals in at least two clock signal provision devices (3, 4) of the telecommunications system, of which at least one includes an interface card to a standardized transmission network,
interruption of a clock signal in the event its quality declines, and
selection of another clock signal by a main clock generator (2) of the telecommunications system in the event the selected clock signal is interrupted.

16. Method according to Claim 15
characterized in that in the step of provision, at least three clock signals are provided and in the step of the selection of the other clock signal, the signal with the highest quality is selected.

17. Method according to Claim 15 or 16
characterized in that the telecommunications system is a digital telecommunications system.

18. Method according to one of Claims 15 through 17
characterized in that the telecommunications system works according to the ATM standard.

19. Method according to one of Claims 15 through 18
characterized in that the provision of the clock signals takes place using at least one transmission route as clock source.

20. Method according to Claim 19
characterized in that the transmission route is a PDH transmission route and the step of determining the quality includes an evaluation of the timing marker bit.

21. Method according to Claim 19
characterized in that the transmission route is an SDH transmission route and the step of determining the quality includes an evaluation of the SSM byte.

22. Method according to Claim 19
characterized in that the transmission route is a SONET transmission route and the step of determining the quality includes an evaluation of the SSM byte.

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23. Method according to one of Claims 15 through 22
characterized in that the step of interrupting a clock signal takes place on a hardware-controlled basis.

24. Method according to one of Claims 15 through 22
characterized in that the step of interrupting a clock signal takes place on a software-controlled basis.

25. Method according to one of Claims 15 through 24
characterized in that the step of selecting the other clock signal takes place on a hardware-controlled basis.

26. Method according to one of Claims 15 through 24
characterized in that the step of selecting the other clock signal takes place on a software-controlled basis.

27. Method according to Claim 26
characterized in that the step of selecting the other clock signal contains a step of reading a local database.

28. Method according to one of Claims 15 through 27
characterized in that following the step of selecting the other clock signal, a step of updating a central database takes place.

29. Method according to one of Claims 15 through 28

CHANGED SHEET

characterized in that following the step of selecting the other clock signal a step of providing an alarm takes place.

Abstract

Telecommunications system and method for generating a master clock in the same

Telecommunications systems must be synchronized to an external clock source. For this purpose, at least two reference clocks which are redundant with each other are used. In the event of the loss of one of the reference clocks, the main processor is informed of such, and it then instructs the main clock generator to switch over to a redundant reference clock. Through the associated time delay, data errors can occur on the transmission route. The invention is intended to reduce the susceptibility of the telecommunications system to disturbance. The peripheral platforms of the telecommunications system with the aid of a quality detector 6 determine the decline in quality of the loss of a clock signal and interrupt the relaying of the clock signal to the main clock generator 2. The main clock generator 2 determines by means of an interrupt detector 7 the interruption and switches over to a redundant reference clock. The method for generating a main clock encompasses the steps of determining clock quality and of interrupting the clock signal in the event its quality declines.

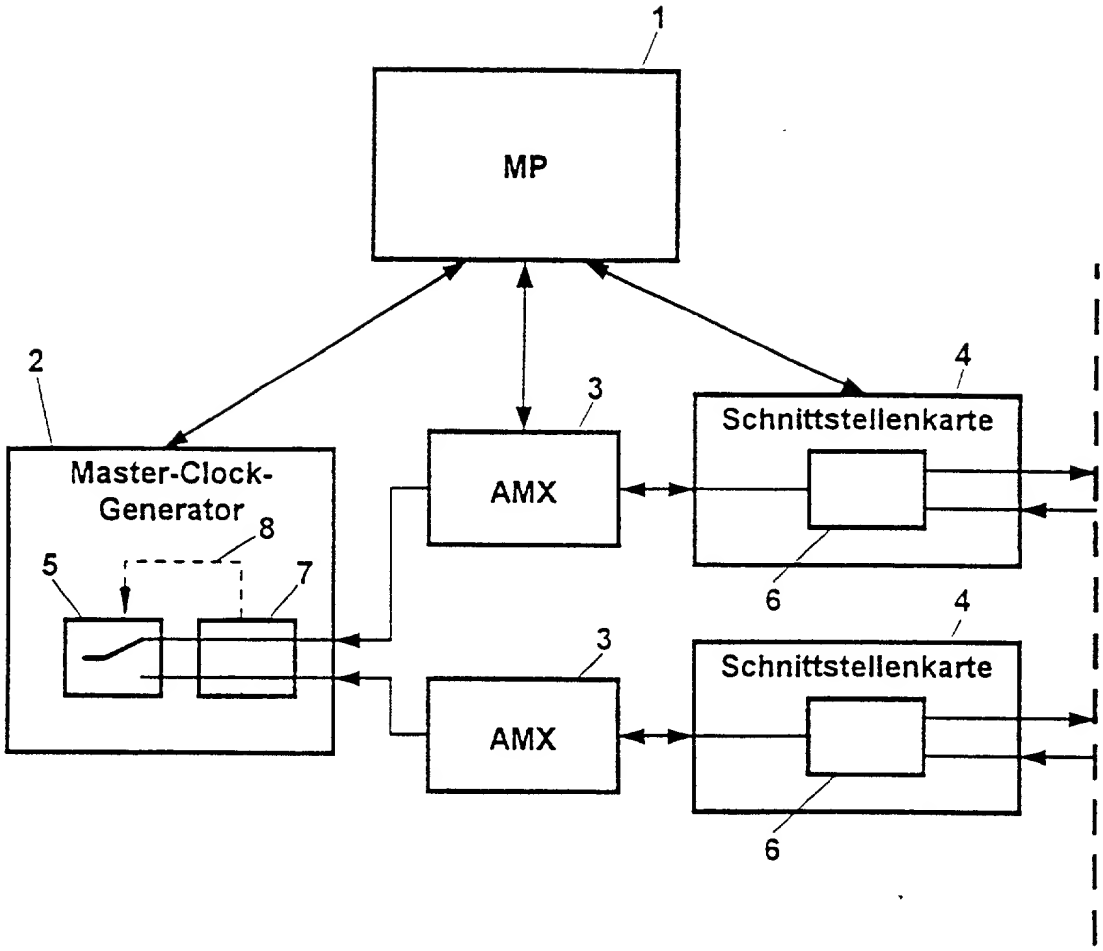

Fig. 1

Key to Figure:

Schnittstellenkarte = Interface card

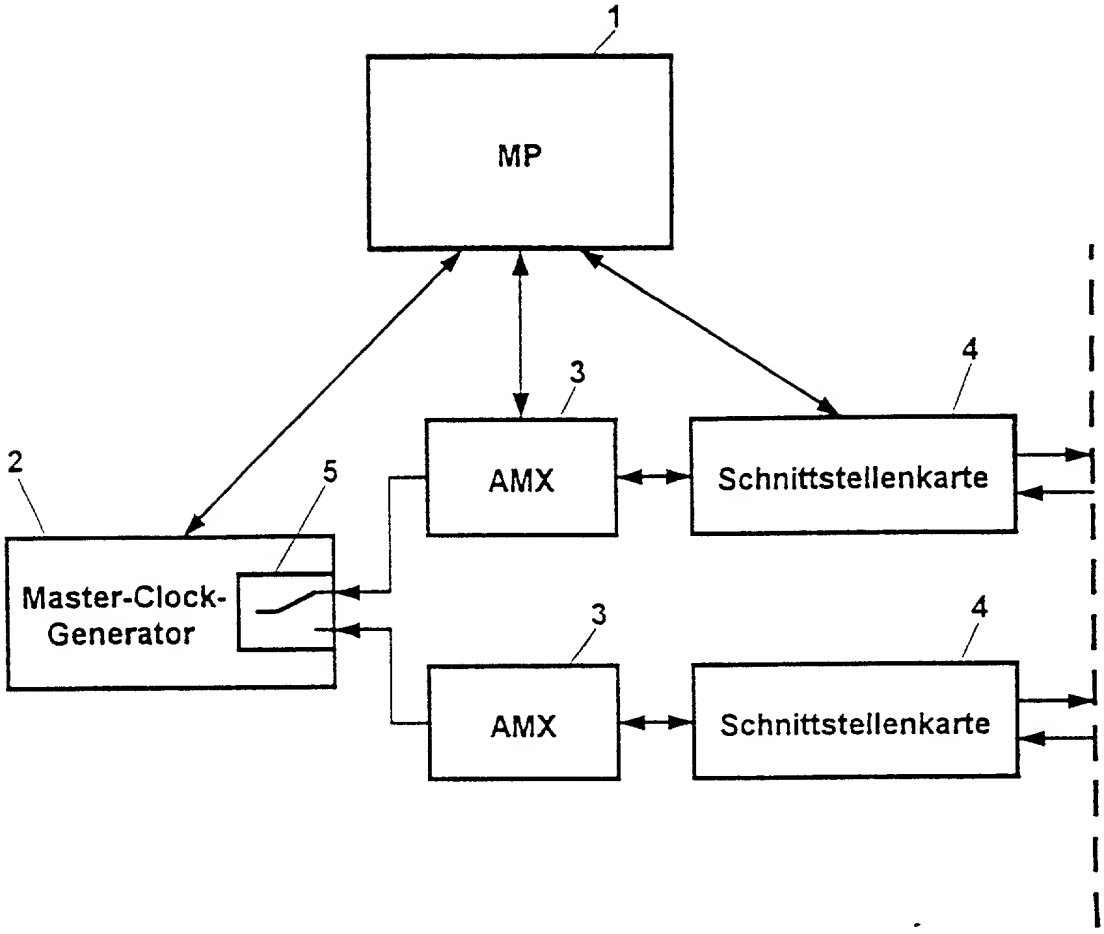

Fig. 2

Key to Figure:

Schnittstellenkarte = Interface card

Voller Name des dritten Miterfinders:	Full name of third joint inventor:
300 RODER, Annette	
Unterschrift des Erfinders Datum	Inventor's signature Date
A Roder 12.03.01	
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500 STEINIGKE, Klaus	
Unterschrift des Erfinders Datum	Inventor's signature Date
Klaus Steinigke 20.1.01	
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Staatsangehörigkeit	Citizenship
Bundesrepublik Deutschland	
Postanschrift	Post Office Address
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Voller Name des sechsten Miterfinders (falls zutreffend):	Full name of sixth joint inventor, if any:
Unterschrift des Erfinders Datum	Inventor's signature Date
Wohnsitz	Residence
Staatsangehorigkeit	Citizenship
Postanschrift	Post Office Address

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors).

German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den nachstehend benannten Patentanwalt (oder die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent- und Warenzeichenamt: *(Name und Registrationsnummer anführen)*

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

And I hereby appoint

Messrs. Eric L. Prahl, Reg. No. 32,590, Frank R. Occhiuti, Reg. No. 35,306, David L. Feigenbaum, Reg. No. 30,378, J. Robin Rohlicek, Reg. No. 43,349, Faustino A. Lichauco, Reg. No. 41,942, Paul A. Pysher, Reg. No. 40,780, Jerry D. Lentz, Reg. No. 33,945, Kenneth F. Kozik, Reg. No. 36,572, Christina Sperry, Reg. No. 47,106, Cathy Peterson, Reg. No. 41,249, Brian Colandreo, Reg. No. 42,427

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Unterschrift des Erfinders Stefan Hennen Datum 19.02.01	Inventor's signature Date
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Voller Name des zweiten Miterfinders (falls zutreffend): BELGARDT, Eckhardt	Full name of second joint inventor, if any:
Unterschrift des Erfinders Eckhardt Belgardt Datum 26.03.01	Second Inventor's signature Date
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(Supply similar information and signature for third and subsequent joint inventors).

Form PTO-FB-240 (8-83)
Patent and Trademark Office-U.S. Department of COMMERCE

German Language Declaration

Prior foreign appplications
Priorität beansprucht

			Priority Claimed	
981 16 322.3	Germany	28. August 1998	☒	☐
(Number) (Nummer)	(Country) (Land)	(Day Month Year Filed) (Tag Monat Jahr eingereicht)	Yes Ja	No Nein
			☐	☐
(Number) (Nummer)	(Country) (Land)	(Day Month Year Filed) (Tag Monat Jahr eingereicht)	Yes Ja	No Nein
			☐	☐
(Number) (Nummer)	(Country) (Land)	(Day Month Year Filed) (Tag Monat Jahr eingereicht)	Yes Ja	No Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35. United States Code. §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occured between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Serial No.) (Anmeldeseriennummer)	(Filing Date) (Anmeldedatum)	(Status) (patentiert, anhängig, aufgegeben)	(Status) (patented, pending, abandoned)
(Application Serial No.) (Anmeldeseriennummer)	(Filing Date) (Anmeldedatum)	(Status) (patentiert, anhängig, aufgeben)	(Status) (patented, pending, abandoned)

Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden koennen, und dass derartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährden können.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

As a below named inventor, I hereby declare that:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

My residence, post office address and citizenship are as stated below next to my name,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Telekommunikationssystem sowie Verfahren zum Erzeugen eines Haupttaktes in demselben

deren Beschreibung

the specification of which

(zutreffendes ankreuzen)

☐ hier beigefügt ist.

☒ am 26. August 1999 als PCT internationale Anmeldung
PCT Anmeldungsnummer PCT/EP99/06284
eingereicht wurde und am _____
abgeändert wurde (falls tatsächlich abgeändert).

(check one)

☐ is attached hereto.

☐ was filed on _____ as PCT international application
PCT Application No. _____
and was amended on _____
(if applicable)

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed: